A STUDY ON SOLID WASTE MANAGEMENT AT UNIVERSITI MALAYSIA PAHANG (UMP), GAMBANG CAMPUS

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SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the Bachelor Degree of Civil Engineering

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Date : 25 June 2018

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Pada masa kini, jumlah penduduk di muka bumi saban hari semakin meningkat dan peningkatan ini telah menyumbang kepada masalah dalam pelbagai sektor dan tidak terkecuali masalah terhadap alam sekitar jika ianya tidak dikawal dengan sebaiknya. Segala jenis benda yang dihasilkan daripada sumber yang tidak digunapakai akan diklasifikasikan sebagai sisa. Institusi juga merupakan salah satu punca bagi menjana sisa. Kajian ini telah dijalankan di tiga kafeteria di Universiti Malaysia Pahang Kampus Gambang iaitu Kafeteria Kimia, Kafeteria Kolej Kediaman 1(KK1) dan 3 (KK3), dan Kafeteria Kolej Kediaman 4 (KK4). Kajian ini dijalankan bertujuan untuk mengkaji dan menentukan komposisi sisa pepejal . Kajian ini juga dijalankan bagi mendapatkan data-data sisa pepejal yang dihasilkan di kawasan institusi , kadar penjanaan dan juga faktor-faktor yang mempengaruhi kadar penjanaan sisa pepejal. Sisa pepejal yang telah dikumpul telah dikeringkan dan berat diambil berdasarkan kategori yang telah dibuat iaitu sisa makanan, kertas, gelas, aluminium dan lain-lain. Selain daripada itu, terdapat lebih kurang sepuluh soalan soal selidik telah diedarkan kepada 300 orang responden termasuk pelajar, kakitangan dan juga pekerja di Universiti Malaysia Pahang. Soal selidik ini dibuat bertujuan untuk mendapatkan maklumat dan pendapat serta pandangan daripada orang ramai mengenai kesedaran terhadap sisa pepejal. Pada akhir pengumpulan data, semua data akan dianalisis dengan menggunakan kaedah statistik dan hasil daripada analisis akan dinilai, dibincangkan dan diringkaskan. Menurut kajian ini, hasil sisa pepejal yang dihasilkan semasa cuti semester bagi tempoh tujuh hari berturut-turut di Kafeteria Kimia adalah sebanyak 7kg/minggu manakala bagi Kafeteria KK1 dan KK3 adalah sebanyak 5.15kg/minggu manakala bagi Kafeteria KK4 adalah sebanyak 7.85kg/minggu. Bagi jumlah sisa pepejal yang dihasilkan semasa semester dijalankan di Kafeteria Kimia adalah sebanyak 38.3kg/minggu, manakala bagi Kafeteria KK1 dan KK3 adalah sebanyak 64.7kg/minggu dan bagi Kafeteria KK4 adalah sebanyak 83.2kg/minggu. Komposisi sisa makanan menunjukkan nilai yang paling tinggi berbanding komposisi lain. Faktor-faktor lain yang mempengaruhi sisa pepejal dikawasan kajian adalah kerana kawasan tersebut merupakan kawasan yang dipenuhi dengan pelajar, kakitangan serta pekerja lain yang makan di kafeteria yang disediakan di dalam Universiti Malaysia Pahang Kampus Gambang.

ABSTRACT

Nowadays, the population is increasing and this increase contributed to problems in various sectors and no exception to the environment if not controlled properly. All types of objects generated from unused resources will be classified as waste. Institutions are also one of the sources to generate residuals. This area of study was at three cafeteria at Universiti Malaysia Pahang Campus Gambang that are Chemical Cafeteria, Kolej Kediaman 1(KK1) and 3(KK3) Cafeteria, and Kolej Kediaman 4(KK4) Cafeteria. This study was conducted to study and determine the composition of solid waste. This study also to obtain data on solid waste generated in the institution, and also the generation of the factors that influence the rate of solid waste generation. The solid waste that has been collected has been dried and weight was taken based on the composition of food waste, paper, glass, aluminium and others. In addition, there are approximately ten-question questionnaire was distributed to 300 respondents including students, staff and workers in the Universiti Malaysia Pahang. The questionnaire was aimed at obtaining information, opinions and views from the public on the awareness of solid waste. At the end of data collection, all data will be analyzed using the statistical method and the results of the analysis will be evaluated, discussed and summarized. According to this study, the results of solid waste generated during the semester break for the seven consecutive days in Chemical Cafeteria was 7kg /week while for KK1 & KK3 Cafeteria was 5.15kg /week while for KK4 Cafeteria was 7.85kg /week. For the amount of solid waste generated during the semester is carried out in the Chemistry Cafeteria was 38.3kg /week, while the cafeteria KK1 & KK3 was 64.7kg /week for the Cafeteria and KK4 was 83.2kg /week. The composition of food waste shows the highest value compared to other compositions. Other factors that affect solid waste in the study are because the area is filled with students, staff and other workers eating at the cafeteria provided at Universiti Malaysia Pahang Campus Gambang.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

%	Percent
Kg	Kilogram
Kg/day	Kilogram per day
Kg/week	Kilogram per week

LIST OF ABBREVIATIONS

3R	Reuse, Reduce, Recycle
UMP	Universiti Malaysia Pahang
KK1 and KK3	Kolej Kediaman 1 and Kolej Kediaman 3
KK4	Kolej Kediaman 4
PVC	Polyvinyl chloride
am	Ante meridiem: Before noon
pm	Post meridiem: After noon

CHAPTER 1

INTRODUCTION

1.1 Introduction

The people of Peninsular Malaysia produced 30,764 tonnes of solid waste per day from 36,659 tonnes of solid waste a day for all of Malaysia including Sabah and Sarawak based on data released in 2014. More than 45.5 percent of wastes dumped into landfills are from organic waste and this is becoming more serious from year to year with the growing population of Malaysia. Major sources that are produced waste are from residential premises, commercial premises and business, establishments, street sweepings, institutional premises such as school, collages, hostel, hospitals and the others. Food waste can be converted into useful components such as soil fertilizer and biomass gases sources. Due to various constraints, source separation for food waste in waste recycling is not commonly practiced in Malaysia.

Waste can be considered as substance or objects which are disposed and may be defined as unwanted materials, from various sources, namely animal and human activity are discarded as unwanted and useless. Waste may be form in solid, liquid or gaseous form and its viewed as a discarded material which has no consumer value to the person.

Solid waste means its consists of both solid and liquid waste but it cannot be classified as waste water. The term that usually used to describe non-liquid waste material arising from domestic, trade, commercial, agriculture and industrial activities and also from public services are solid waste. Solid waste also consists of any refuse, sludge from wastewater treatment plant, water supply treatment plant or air pollution control facility or other discarded materials including solid, small amounts of solid,

semi-solid or contain gaseous materials resulting from industrial, commercial, mining and agricultural operations and from community activities.

Any urban solid waste which is biodegradable and non-degradable but is not corrosive, toxic, ignite or reactive is considered non-hazardous solid waste materials known as non-hazardous waste.

1.2 Problem Statement

In Malaysia, every day the solid waste generated is growing as a result of the ongoing economy as well as the growing economy and the rapidly growing economy throughout Malaysia which leads to the improvement of living standards and the population in the area.

Solid waste generated by UMP residents is to much in the cafeteria on a daily basis because they do not practice the 3R concept (Reuse, Reduce, Recycle). It is because of no ongoing campaign about disadvantages not practice the 3R concept among the students themselves, staff and employees.

Lack of awareness is also one of the causes of environmental pollution resulting from solid waste because of the casualness practiced. For example, most of students and staff of Universiti Malaysia Pahang themselves want to wrap the food using the prepared plastic which will result to a large amount of waste generated at Universiti Malaysia Pahang (UMP). This leads to the addition to the production of plastic materials.

1.3 Objectives

The purpose of this study are as follows :

i. To determine the composition and the total quantity of the waste generated in three cafeteria in Universiti Malaysia Pahang, Gambang campus.
ii. To identify the awareness level among the UMP students, staff, cafeteria owner, workers and hostel management.

iii. To provide the potential recommendation to improve the level of solid waste management in Universiti Malaysia Pahang Gambang Campus.

1.4 Scope of the Study

This study have been conducted in three cafeteria in Universiti Malaysia Pahang, Gambang Campus that are Chemistry Cafeteria, Kolej Kediaman 1(KK1) and 3(KK3) Cafeteria and Kolej Kediaman 4(KK4) Cafeteria. The solid waste collected from the cafeteria and have been dried before weighed according to the composition that has been made. The composition of the solid waste are food waste, paper, plastics, glass, aluminium and others. The data was collected based on peak hour and off peak for a week during semester break(off peak) and a week during the semester session(peak). While for the questionnaire, there are 300 respondent that was given the responded based on the question that asked and need to give their opinion based on the solid waste in the cafeteria.

1.5 Significance of the Study

By identifying the type of composition of solid waste that produced in each study area and feedback from the responded, so the solution have been made on how to reduce and managed the solid waste. The type of waste and the amount generated will be studied so that the existing system can be improved in order to reduce the solid waste in the study. Reuse, reduce and recycle (3R) campaigns can be improved and expanded so that awareness arises in everyone because this is the best way to reduce waste.

The reuse of solid waste such as water bottles, beverage cans, food waste and so on can reduce the production of solid waste in the cafeteria area as well as nurture the importance of green technology within each individual.

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